

RADIONUCLIDES

FILE NO.: 3150 AUTHORITY NO.24/0539

HOLDER OF AUTHORITY:

AFNET CC

In terms of section 3A of the Hazardous Substances Act, 1973 (Act 15 of 1973), the above-mentioned is authorised to perform the following, in respect of the radioactive nuclides and premises specified in the annexures:

CONVEY

SECTION OR DEPARTMENT

PREMISES ADDRESS:

5 DORMEHL STREET
ANDERBOLT STREET
BOKSBURG

1459

Radiation Protection Officer: MR J MCGILL Cellphone: 060-984 9811

Acting Radiation Protection Officer: MR J PURCELL Cellphone: 084-467 2647

CONDITIONS

This authority:

1. is subject to the Regulations relating to Group IV Hazardous Substances;
2. **expires on 31 July 2025**
3. is subject to the following conditions: **SEE ANNEXURE 3**

Botumelo Seemole-Makubetela

SAHPRA

Chief Executive Officer

Date

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Please note: Tables referenced in this condition can be found in the IAEA Safety Standards document SSR-6: Regulations for the Safe Transport of Radioactive Material 2012 Edition.

1. The current edition of the IAEA Regulations for the Safe Transport of Radioactive Material (SSR-6) must be adhered to at all times when radioactive material is transported in South Africa.
2. The Guideline on Transport of Radioactive Sources [RN-26A] published by SAHPRA Radiation Control must be adhered to at all times when radioactive material is transported in South Africa.
3. An enclosed and lockable vehicle must be used to transport radioactive sources.
4. The vehicle referred to in paragraph 3 must be fitted with an alarm system as well as a satellite vehicle recovery system. The vehicle recovery system must provide countrywide coverage, including border posts.
5. The equipment must be firmly secured to the vehicle during transportation.
6. A vehicle may not be left unattended with a radioactive source in it. However, an exception may be made if a person is required to make an overnight stop during transportation of a radioactive sources, and a suitable storage facility is not available. In such a case the radioactive source must be considered as being under transport during the night. The vehicle must be securely locked and parked in a lock-up garage. Where practicable, the vehicle must be left on the premises of a police station during the night.
7. Three removable transport labels must be displayed on the vehicle during transportation of radioactive sources: one sign on each side and one on the rear of the vehicle. The name and telephone number of a person to be contacted in the event of an emergency must also appear adjacent to the transport labels. Transport labels must be removed when the radioactive material is no longer in the vehicle.
8. Equipment may not be transported in the passenger compartment of the transport vehicle and must be positioned as far as possible from any person in the vehicle. The maximum dose rate at the position of any person in the vehicle must not exceed 20 uSv/h (2 mR/h).
9. If equipment is, or appears to be, damaged in transport, the following actions must be taken:
 - (i) The driver at the time of the incident must notify the holder of the authority and SAHPRA Radiation Control.
 - (ii) The driver must ensure that the equipment is carefully examined and a radiation survey is done to verify that it continues to comply with the Regulations.
10. Portable fire extinguishers of a suitable type and capacity must be carried in the transport vehicle.
- 11 In the event of an incident or accident during transport, SAHPRA Radiation Control must be notified immediately.
12. Barricade and warning tapes must be carried in the transport vehicle, so that in case of a road accident, the area around the scene of the accident could be cordoned off if necessary.
13. The driver of the transport vehicle must have a copy of this authority in their possession.
- 14 This authority does not relieve the consignor or the transport contractor from compliance with any requirement or road traffic law of the local government of any province in South Africa through or into which the radioactive material will be transported.
15. Radiation Control must be notified in writing within 24 hours after the

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radioactive material has been delivered to the NECSA for disposal.

16. Only temporary storage is permitted, with a maximum storage time of 3 days.
17. The holder of the authority must ensure that a document is drawn up outlining correct working procedures. The document must include details of all relevant safety procedures laid down by Radiation Control and must specify what actions are to be taken in the event of an emergency. The holder of the authority must take steps to ensure that their employees adhere to the correct working procedures.
18. During transport, equipment must be protected from water, sand or other foreign matter.
19. In addition to the requirement of ALARA, the authorityholder and radiation protection officers must ensure that radiation doses to individuals (including themselves) do not exceed the limits specified by Radiation Control.
20. General requirements for all packages;
All containers or packages must comply with the following general requirements:
 - (i) The package design must be such that it can be easily handled, transported and secured during transport.
 - (ii) Lifting attachments on packages must not fail when used in the intended manner. If failure occurs it must not impair other requirements. Lifting attachments must either be able to support the package or be removed or rendered incapable during transport.
 - (iii) External surfaces must be free from protruding features for easy decontamination.
 - (iv) The outer packaging must, as far as possible, prevent the retention of water.
 - (v) Features added to the package during transport must not reduce its safety.
 - (vi) The package and its closing devices must not be affected under conditions it would be likely to experience during transport.
 - (vii) The materials of the package must be physically and chemically compatible with each other and with the radioactive contents.
 - (viii) Valves through which radioactive material can escape must be protected against unauthorised operation.
 - (ix) Other dangerous properties of contents such as explosiveness, flammability, pyrophoricity, chemical toxicity and corrosiveness must be taken into account.
21. Requirements for excepted packages
 - (i) The package must meet the general requirements for all packages stated in paragraph 20.
 - (ii) The radiation levels on the external surface of the package must not exceed 5 uSv/h.
 - (iii) Excepted packages may contain radioactive material which is enclosed in or forms a component part of an instrument and does not exceed the limits specified in columns 2 and 3 in Table 4 on page 51 of SSR-6, provided that:
 - (a) the radiation levels 10 cm from the external surface of the unpacked instrument or product do not exceed 0.1 mSv/h;
 - (b) the instrument or article (except radioluminescent timepieces or devices) is marked "RADIOACTIVE".
 - (iv) Excepted packages may contain radioactive material in forms other than as specified in subparagraph 21(iii), with an activity not exceeding the limits specified in column 4 of Table 4, on page 51 of SSR-6, provided that:
 - (a) the packages retain their contents under conditions likely to be encountered in routine transport;

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- (b) the packages bear the marking "RADIOACTIVE" on an internal surface in such a manner that a warning of the presence of radioactive material is visible on opening the package.

22. Requirements for Type A packages

Radioactive material in quantities which represent a limited radiation risk may be carried in a Type A package, which must be designed to withstand normal conditions of transport. The source containers incorporated in nuclear gauges are often approved Type A containers, so that many gauges can be transported as is. Where this is not the case, the user must provide their own container. Containers that would typically meet Type A standards are strong metal cans (tins) or sturdy wooden boxes. Type A containers do not require the specific approval of SAHPRA Radiation Control, but it is the responsibility of the consignor to ensure that they use a container that would comply with the requirements listed below. If suitable packaging is not readily available, standard Type A containers can be obtained from NECSA.

The SAHPRA Guideline on Transport of Radioactive Sources [RN-26A] should be consulted when a decision must be made as to whether radioactive material may be transported in a Type A package or not, as there are limits on the activity which may be transported in such a package.

Type A packages must comply with the following requirements:

- (i) The package must meet the general requirements for all packages stated in condition 20.
- (ii) The smallest overall external dimension of the Type A package must not be less than 10 cm.
- (iii) The outside of the Type A package must incorporate a feature such as a seal, which is not readily breakable and which, while intact, will be evidence that it has not been opened.
- (iv) Tie-down attachments must under all conditions not impair the ability of the package to meet the requirements of Radiation Control.
- (v) Package design must take into account temperatures ranging from -40 oC to 70 oC.
- (vi) The package must include a containment system which cannot be opened unintentionally.
- (vii) If the containment system forms a separate unit of the package, it must be capable of being securely closed by a positive fastening device which is independent of any other part of the packaging.
- (viii) The containment system must retain its radioactive contents under a reduction of ambient pressure to 25 kPa.
- (ix) All openings, e.g. exit channels, valves, etc., must be closed to retain leakage.
- (x) Packages containing liquids must:
 - a. have absorbent material to absorb twice the volume of the contents if the volume is less than 50 ml;
 - b. must have primary inner and secondary outer containment components for the retention of the liquid if the volume exceeds 50 ml;
 - c. must make provision for ullage to accommodate variations in temperature, dynamic effects and filling dynamics.
- (xi) Type A packages should also be able to withstand a number of tests. These tests include a water spray test, a free drop test, a stacking test and a

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penetration test.

- (xii) If the contents are special form radioactive material, and exceed the A2 activity limit, the approval by SAHPRA Radiation Control of the design for the special form radioactive material is required.
- (xiii) The package must be so designed that, under normal conditions of transport, it must prevent loss or dispersal of the radioactive contents, and loss of shielding integrity which would result in more than a 20% increase in the radiation level on any external surface.

23. Requirements during transportation

23.1 Segregation during transport and during storage in transit

- (i) Radioactive material must be segregated sufficiently from transport workers and from members of the public. For the purpose only of calculating segregation distances or dose rates in regularly occupied areas, different limiting values for dose shall be required:
 - (a) For transport workers a dose level of 5 mSv per year must be used as the limiting value.
 - (b) For members of the public a dose level of not more than 1 mSv per year to the critical group must be used as the limiting value.
- (ii) Radioactive material must be segregated from undeveloped photographic film so that the radiation exposure of the film is limited to 0.1 mSv per consignment of such film.
- (iii) Categories II-YELLOW or III-YELLOW packages must not be carried in compartments occupied by passengers except for exclusively authorised personnel.
- (iv) The number of category II-YELLOW and category III-YELLOW packages, overpacks, tanks and freight containers stored in any one area must be so limited that the total sum of the transport indices in any individual group of such packages does not exceed 50. Groups of such packages must be stored so as to maintain a spacing of at least 6 m from other groups of such packages.
- (v) Only articles or documents which are necessary for the use of radioactive material are permitted in the package provided that there is no interaction between them and the packaging or its contents that would reduce the safety of the package. Other items may not be transported in packages.
- (vi) Mixing of packages of different kinds of radioactive material, including fissile material, and mixing of packages with different indexes (TI's) is permitted.
- (vii) Consignments must be segregated from other dangerous goods.

23.2 Additional requirements relating to rail and road

- (i) Vehicles or railroad carriages carrying packages with category I-WHITE, II-YELLOW and III-YELLOW transport labels must display radiation warning signs. Vehicles carrying excepted packages need not be so marked.
- (ii) No persons other than the driver and assistants must be permitted in vehicles carrying packages bearing category II-YELLOW or III-YELLOW labels.

24. Labelling and documentation

- 24.1 Labelling and marking of packages, freight containers, tanks and overpacks
See Table 8. CATEGORIES OF PACKAGES on page 65 of SSR-6.

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- (i) Completed WHITE or YELLOW labels with the contents described (with the name of the radionuclide, or for mixtures, the names of the most restrictive nuclides) must be affixed externally to two opposite sides of packages and to all four sides of tanks.
- (ii) Each label must be marked with the maximum activity of the radioactive contents during transport.
- (iii) Each YELLOW label must be marked with the TI for that package.
- (iv) Packages with a gross mass exceeding 50 kg must be legibly and durably marked with their permissible gross mass on the outside.
- (v) Packages must be legibly and durably marked on the outside with the word "TYPE A" or "TYPE B(U)" or whatever is applicable.
- (vi) Packages containing materials having additional dangerous properties (e.g. uranium hexafluoride) must also be labelled as required by other relevant transport regulations.

24.2 Placards on vehicles, freight containers and tanks

- (i) Placards must be affixed in a vertical orientation:
 - (a) to the two external walls of a rail vehicle;
 - (b) to the two external lateral walls and the external rear wall of a road vehicle; and
 - (c) to the two external side walls and the two external end walls of a freight container or tank; alternatively, enlarged labels may be used.
 - (ii) The appropriate UN Number must be displayed on all four sides of the freight container.
 - (iii) Any placards that do not relate to the contents must be removed.
 - (iv) Placards may be required for other dangerous properties of the contents.
 - (v) An emergency telephone number along with the name of a person to be contacted in the event of an accident, must be displayed on all placards.
25. The conveyor may not accept any items containing Group IV hazardous substances unless the consignor is in possession of written approval by Radiation Control to dispose of the specific items offered for conveyance.
26. The transporting vehicle must be accompanied by an accompanying security vehicle when transporting radioactive material. Alternatively drivers must be accompanied by co-drivers when transporting radioactive material.
27. All drivers and co-drivers of transport vehicles must be issued with electronic digital audible alarm dosimeters of a type approved by Radiation Control.
28. Radionuclides may not be removed from approved containers for any reason whatsoever.
29. Only sources that are listed on valid possess and use authorities may be accepted for conveyance, unless prior written authority has been obtained from Radiation Control.
30. This authority only makes provision for the transport of Type A packages.
31. No nuclear material may be stored in a vehicle. It must be stored in a safe storage place, consisting of a building or part thereof or other structure on premises that has been zoned by a public authority for business purposes or on which a business may legally be operated.

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